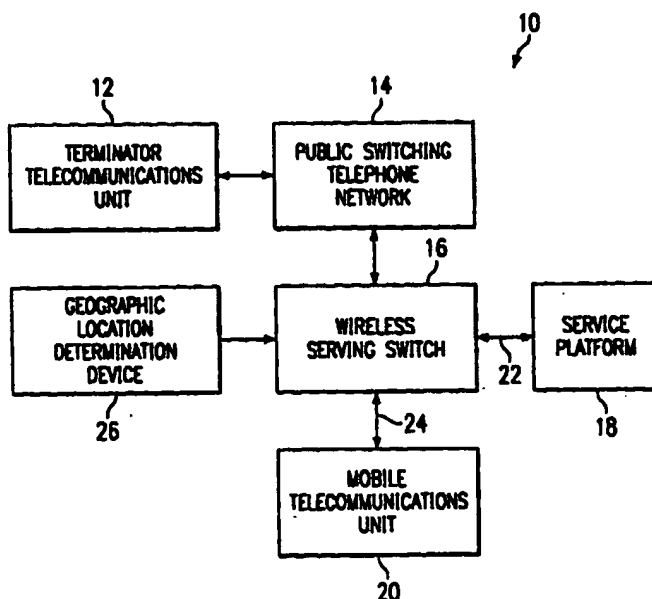


PCTWORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : H04Q 7/20	A1	(11) International Publication Number: WO 98/57506 (43) International Publication Date: 17 December 1998 (17.12.98)
(21) International Application Number: PCT/US98/12056 (22) International Filing Date: 9 June 1998 (09.06.98) (30) Priority Data: 08/874,065 12 June 1997 (12.06.97) US (71) Applicant: NORTHERN TELECOM LIMITED [CA/CA]; World Trade Center of Montreal, 8th floor, 380 St. Antoine Street West, Montreal, Quebec H2Y 3Y4 (CA). (71)(72) Applicants and Inventors: LARKINS, John, Pruett [US/US]; 811 Charter Oak, Allen, TX 75002 (US). STEPHENS, Gary, Boyd [US/US]; 822 Deerlake Drive, Allen, TX 75007 (US). (74) Agents: MCCOMBS, David, L. et al.; Haynes and Boone, 3100 NationsBank Plaza, 901 Main Street, Dallas, TX 75202-3789 (US).		(81) Designated States: CA, MX, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>

(54) Title: DIRECTORY SERVICE BASED ON GEOGRAPHIC LOCATION OF A MOBILE TELECOMMUNICATIONS UNIT



(57) Abstract

A system and method of providing an automatic directory service for a mobile telecommunications unit (20) is based on the geographic location of the mobile unit. A user of the mobile unit places a telephone call to a desired service/goods provider using a wireless telecommunications unit. The call first accesses a wireless switch system (16), which in turn communicates with a service platform (18). The message includes the geographic location of the mobile unit. The mobile unit is then automatically connected to the facility of the service/goods provider in closest geographic proximity to the mobile unit.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon			PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakhstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

DIRECTORY SERVICE BASED ON GEOGRAPHIC LOCATION OF A MOBILE TELECOMMUNICATIONS UNIT

Background of the Invention

This invention relates to a system and method for providing automatic directory service assistance for a mobile telecommunications unit based upon the geographic location of the mobile unit.

5 As mobile telecommunication units, in particular, mobile cordless telephones, become ubiquitous, the need exists for a method and system of providing, automatically to the mobile telecommunications unit and its user, a connection to the closest facility, store, or other desired destination of the user, based on the geographic location of the mobile unit. As an alternative,
10 the telephone number of the closest facility could be provided to the mobile unit instead of the connection being made automatically.

 As more and more people travel about with cordless phones, it becomes important for the mobile unit user to know the location of a nearest store or other facility of a service/goods provider without having to
15 consult a directory assistance provider, such as 411, for an intervening operator. Typically, the operator will not give closest store information -- only a telephone number of a requested store. If the location of the closest store is not known to the mobile unit user, the 411 provider is not useful.

 At present, to locate the phone number of the closest store to a mobile
20 telephone user, the user must otherwise consult a hard copy directory, such as a telephone book. For drivers using cell telephones in automobiles, it is difficult and dangerous for those drivers to consult a phone book while driving or to pull over to consult a phone book. Thus, the need exists for the automatic method of the present invention.

Summary of the Invention

 This invention is for a system and method of providing an automatic directory service for a mobile telecommunications unit based on the geographic location of the mobile unit. A user of the mobile unit places a telephone call to a desired service/goods provider using a wireless
30 telecommunications unit. The call first accesses a wireless switch system

and is then sent on to a service platform. The message to the service platform includes the geographic location of the mobile unit. The service platform then provides a lookup in a database, using the geographic location information provided, and either sends to the mobile unit the telephone
5 number of the facility located geographically in closest proximity to the mobile unit, or, automatically connects the mobile unit to the closest geographical facility.

Brief Description of the Drawings

FIG. 1 schematically illustrates an embodiment of the method and
10 system of the present invention.

Detailed Description of the Preferred Embodiments

Referring to FIG. 1, the system and method of the present invention is schematically illustrated. The directory system 10 includes various components. In general, a remote mobile telecommunications unit 20,
15 typically a wireless telephone, which could also be a computer or other device capable of wireless telecommunications, initiates a telecommunications message, or telephone call, to a desired service/goods provider (not shown) for the facility in closest proximity to the mobile unit 20, or for the nearest facility that services the geographic area where the
20 mobile unit 20 is located, where the desired service/goods provider has more than one facility at more than one geographic location. The user of the mobile unit 20 does not know the geographic location of the nearest facility of the service/goods provider, such as a Home Depot, Pizza Hut, or other large chain or provider of services/goods, but does know a specific
25 information number to call which will place the user of the mobile unit 20 in contact with the facility of the desired service/goods provider closest geographically to the mobile unit 20.

Once the telephone message is initiated by the mobile unit 20, the message is received by a wireless serving switch 16 which in turn passes
30 the message to a service platform 18. The wireless switch 16 first passes the message to a service platform 18 using an established standard communications protocol such as CTIA IS-41 or ITU GSM MAP. The

telecommunications message 24 between the mobile unit 20 and wireless serving switch 16 is typically in AMPS protocol or GSM.

The IS-41 standard typically includes an origination request (ORREQ) from the wireless serving switch 16 to the service platform 18. Within the ORREQ is typically various information, including a parameter (PARM) which contains the geographic location of the mobile unit 20. The service platform 18 replies with an ORREQ response to wireless serving switch 16. In the response, is information representing the phone number of the facility for the service/goods provider which is located geographically closest to the geographic location of the mobile unit 20, or which services the geographic area in which mobile unit 20 is located. The service platform 18 determines this phone number by performing a lookup in a database which contains telephone numbers of each facility for a typical service/goods provider, including its geographic location. A match is then made between the geographic location of the mobile unit 20 and the facility of the service/goods provider in closest proximity to the mobile unit 20, or between the geographic location of the mobile unit 20 and the facility of the service/goods provider which services the geographic area where the mobile unit 20 is located.

At this point, one of two operations may transpire; 1) either the information containing the telephone number of the closest geographic facility, or facility servicing the area of the mobile unit 20, is provided through the wireless serving switch 16 back to the mobile unit 20, or, 2) the mobile unit 20 is connected by the wireless serving switch 16 through a public switching telephone network (PSTN) 14 to a terminator telecommunications unit 12, representing the facility of the desired service/goods provider located closest geographically to the mobile unit 20, or which services the geographic area of the mobile unit 20.

In another embodiment of this invention, the user of the mobile unit 20 must input an access code, or other type of authorization data, prior to the directory service function being implemented for the mobile unit 20 user.

The geographic position of the mobile unit 20 may be determined by a geographic location determination device 26 in various ways. In one instance, a space based satellite, such as a GPS satellite platform, or other space-based platform, which performs geographic placement functions, may be used to provide information regarding the geographic location of the mobile unit 20. In another embodiment, the mobile unit 20 itself may provide its own geographic location. In a further embodiment, a triangulation calculation is performed by a geographic location device, or a distance delay calculation is performed by a similar device to similarly determine the geographic location of the mobile unit 20. Alternatively, signal strength readings can be taken from a plurality of antenna where individual antenna are located in separate geographic "cells." The location of mobile unit 20 would be determined to be within the cell whose antenna detects the strongest signal from the mobile unit 20. This method of geographic locating would not be as accurate as the GPS method described above. Any of these geographic location methods may provide geographic location information to the wireless serving switch 16, which in turn, provides, in a PARM, the geographic information concerning mobile unit 20 to service platform 18.

These embodiments and examples described above are illustrative of various embodiments of the system and method of the present invention. Those of skill in the art may recognize that other embodiments are encompassed within the scope of the claims set forth herein.

What is claimed is:

- 1 1. A method of providing a directory service for a mobile
2 telecommunications unit based on a geographic location of the mobile unit,
3 comprising the steps of:
 - 4 a) receiving a first telephone number of a desired
5 service/goods provider from the mobile telecommunications unit into
6 a wireless serving switch, wherein said service/goods provider has a
7 facility at more than one geographic location;
 - 8 b) sending a first message from said wireless serving
9 switch to a service platform, wherein said first message includes the
10 geographic location of said mobile telecommunications unit; and
 - 11 c) receiving a second message from said service platform
12 at said wireless serving switch, wherein said second message includes
13 a second telephone number of said service/goods provider, wherein
14 said second telephone number is for a facility of said service/goods
15 provider located geographically in closest proximity to said mobile
16 unit.
- 1 2. The method of claim 1, further comprising the step of sending said
2 second telephone number to said mobile unit.
- 1 3. The method of claim 1, further comprising the step of automatically
2 connecting said mobile unit to said service/goods provider facility located
3 geographically closest to said mobile unit.
- 1 4. The method of claim 3, wherein said step of connecting is
2 accomplished by connecting said mobile unit to said closest provider facility
3 via a public switching telephone network.
- 1 5. The method of claim 1, wherein said service platform includes a data
2 base which includes telephone numbers of various service/goods providers
3 which have a facility at more than one geographic location, including the

4 telephone number of each said facility and the geographic location of each
5 said facility.

1 6. The method of claim 1, further comprising the step of acquiring the
2 geographic location of said mobile unit and providing said geographic
3 location to said service platform.

1 7. The method of claim 6, wherein said step of acquiring is accomplished
2 by providing a geographic location message from said mobile unit to said
3 serving switch.

1 8. The method of claim 6, wherein said step of acquiring is accomplished
2 by providing a geographic location message from a space based satellite to
3 said serving switch.

1 9. The method of claim 6, wherein said step of acquiring is accomplished
2 by a device which performs at least one triangulation calculation.

1 10. The method of claim 6, wherein said step of acquiring is accomplished
2 by a device which performs at least one distance delay calculation.

1 11. The method of claim 6, wherein said step of acquiring is accomplished
2 by an antenna in a geographic cell, among a plurality of cells, which
3 receives the strongest signal from said mobile unit.

1 12. The method of claim 1, further comprising the step of providing an
2 authorization code from said mobile unit to said service platform which
3 authorizes the step of sending a second message from said service platform.

1 13. A directory service system based on geographic location of a mobile
2 telecommunications unit, comprising:
3 a mobile wireless telecommunications unit;

4 a wireless serving switch for receiving communications from
5 said mobile unit; and

6 a service platform which communicates with said serving
7 switch;

8 wherein said serving switch receives from the mobile unit a
9 first telephone number of a service/goods provider;

10 wherein said serving switch provides to said service platform
11 the geographic location of said mobile unit; and

12 wherein said service platform provides to said serving switch
13 a second telephone number of a facility of said service/goods provider
14 located geographically closest to said mobile unit.

1 14. The system of claim 13, wherein said service platform includes a data
2 base which includes telephone numbers of various service/goods providers
3 which have a facility at more than one geographic location, including the
4 telephone number of each said facility and the geographic location of each
5 said facility.

1 15. The system of claim 13, further comprising a public switching
2 telephone network which connects said serving switch to said nearest
3 geographic service/goods provider facility.

1 16. The system of claim 13, wherein said serving switch connects said
2 mobile unit to said nearest geographic service/goods provider facility.

1 17. The system of claim 13, wherein data representing the geographic
2 location of said mobile unit is provided to said serving switch.

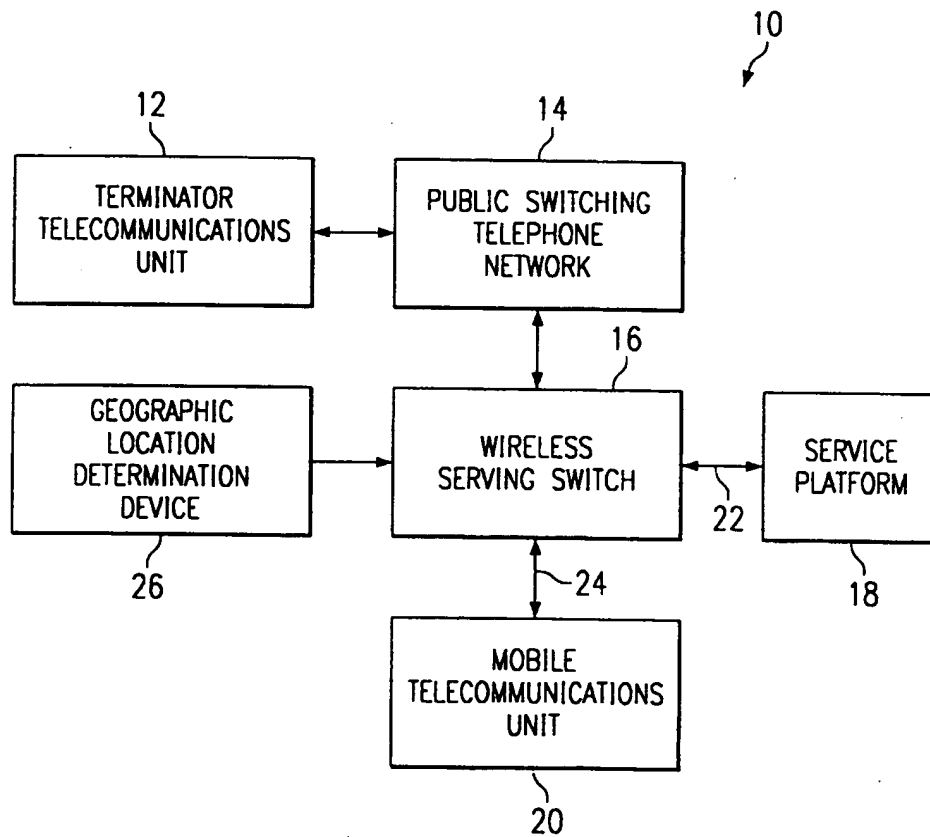
1 18. A method of providing a directory service for a mobile
2 telecommunications unit based on the geographic location of the mobile
3 unit, comprising the steps of:

4 a) receiving a first telephone number of a desired
5 service/goods provider from the mobile telecommunications unit to a
6 wireless serving switch, wherein said service/goods provider has a
7 facility at more than one geographic location;

8 b) sending a first message from said wireless serving
9 switch to a service platform, wherein said first message includes the
10 geographic location of said mobile telecommunications unit; and

11 c) receiving a second message from said service platform
12 at said wireless serving switch, wherein said second message includes
13 a second telephone number of said service/goods provider, wherein
14 said second telephone number is for a facility of said service/goods
15 provider which services geographic area where said mobile unit is
16 located.

1 / 1



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/12056**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(6) :H04Q 7/20

US CL :455/456

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 455/456, 422, 432, 433, 435, 457, 517, 524

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,561,074 A (SALIMANDO) 1 October 1996, col. 1, line 29 - col. 2, line 9, col. 2, lines 25-67, col. 3, lines 16-27.	1-18
A	US 5,801,638 A (OZAKI) 1 September 1998, Fig. 1.	1-18



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
E earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*R* document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

10 SEPTEMBER 1998

Date of mailing of the international search report

13 OCT 1998

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

SAM BHATTACHARYA

Telephone No. (703) 305-4040